What is claimed is:

1. An isolated nucleic acid encoding a GALR3 receptor.

2. The nucleic acid of claim 1, wherein the nucleic acid is DNA.

3. The DNA of claim 2, wherein the DNA is cDNA.

4. The DNA of claim 2, wherein the DNA is genomic DNA.

5. The nucleic acid of claim 1, wherein the nucleic acid is RNA.

6. The nucleic acid of claim 1, wherein the nucleic acid encodes a vertebrate GALR3 receptor.

7. The nucleic acid of claim 1, wherein the nucleic acid encodes a mammalian GALR3 receptor.

8. The nucleic acid of claim 1, wherein the nucleic acid encodes a rat GALR3 receptor.

9. The nucleic acid of claim 1, wherein the nucleic acid encodes a human GALR3 receptor.

10. The nucleic acid of claim 7, wherein the nucleic acid encodes a receptor characterized by an amino acid sequence in the transmembrane region which has a homology of 70% or higher to the amino acid sequence in the transmembrane region of the rat

GALR3 receptor and a homology of less than 70% to the amino acid sequence in the transmembrane region of any GALR1 receptor.

11. The nucleic acid of claim 7, wherein the nucleic acid encodes a mammalian GALR3 receptor which has substantially the same amino acid sequence as does the GALR3 receptor encoded by the plasmid K1086 (ATCC Accession No. 97747).

12. The nucleic acid of claim 8, wherein the nucleic acid encodes a rat GALR3 receptor which has an amino acid sequence encoded by the plasmid K1086 (ATCC Accession No. 97747).

13. The nucleic acid of claim 7, wherein the nucleic acid encodes a mammalian GALR3 receptor which has substantially the same amino acid sequence as does the GALR3 receptor encoded by the plasmid pEXJ-RGalR3T (ATCC Accession No. 97826).

14. The nucleic acid of claim 8, wherein the nucleic acid encodes a rat GALR3 receptor which has an amino acid sequence encoded by the plasmid pEXJ-RGalR3T (ATCC Accession No. 97826).

15. The nucleic acid of claim 8, wherein the nucleic acid encodes a rat GALR3 receptor having substantially the same amino acid sequence as the amino acid sequence shown in Figure 2 (Seq. ID No. 2).

16. The nucleic acid of claim 8, wherein the nucleic acid encodes a rat GALR3 receptor having the amino

acid sequence shown in Figure 2 (Seq. ID No. 2).

17. The nucleic acid of claim 7, wherein the nucleic acid encodes a mammalian galanin receptor which has substantially the same amino acid sequence as does the GALR3 receptor encoded by the plasmid pEXJ-hGalR3 (ATCC Accession No. 97827).

18. The nucleic acid of claim 9, wherein the nucleic acid encodes a human galanin receptor which has an amino acid sequence encoded by the plasmid pEXJ-hGalR3 (ATCC Accession No. 97827).

19. The nucleic acid of claim 9, wherein the human GALR3 receptor has a sequence, which sequence comprises substantially the same amino acid sequence as the sequence shown in Figure 4 (Seq. I.D. No. 4) from amino acid 60 through amino acid 427.

20. The nucleic acid of claim 19, wherein the human GALR3 receptor has a sequence, which sequence comprises the sequence shown in Figure 4 (Seq. I.D. No. 4) from amino acid 60 through amino acid 427.

21. An isolated nucleic acid encoding a modified GALR3 receptor, which differs from a GALR3 receptor by having an amino acid(s) deletion, replacement or addition in the third intracellular domain.

22. The nucleic acid of claim 21, wherein the modified GALR3 receptor differs by having a deletion in the third intracellular domain.

23. The nucleic acid of claim 21, wherein the modified GALR3 receptor differs by having a replacement or addition to the third intracellular domain.

24. A purified GALR3 receptor protein.

25. A vector comprising the nucleic acid of claim 1.

26. A vector comprising the nucleic acid of claim 9.

27. A vector of claim 25 adapted for expression in a bacterial cell which comprises the regulatory elements necessary for expression of the nucleic acid in the bacterial cell operatively linked to the nucleic acid encoding a GALR3 receptor as to permit expression thereof.

28. A vector of claim 25 adapted for expression in an amphibian cell which comprises the regulatory elements necessary for expression of the nucleic acid in the amphibian cell operatively linked to the nucleic acid encoding a GALR3 receptor as to permit expression thereof.

29. A vector of claim 25 adapted for expression in a yeast cell which comprises the regulatory elements necessary for expression of the nucleic acid in the yeast cell operatively linked to the nucleic acid encoding a GALR3 receptor as to permit expression thereof.

30. A vector of claim 25 adapted for expression in an insect cell which comprises the regulatory elements

necessary for expression of the nucleic acid in the insect cell operatively linked to the nucleic acid encoding the GALR3 receptor as to permit expression thereof.

31. A vector of claim 30 which is a baculovirus.

32. A vector of claim 25 adapted for expression in a mammalian cell which comprises the regulatory elements necessary for expression of the nucleic acid in the mammalian cell operatively linked to the nucleic acid encoding a GALR3 receptor as to permit expression thereof.

33. A vector of claim 25 wherein the vector is a plasmid.

34. The plasmid of claim 33 designated K1086 (ATCC Accession No. 97747).

35. The plasmid of claim 33 designated pEXJ-hGalR3 (ATCC Accession No. 97827).

36. The plasmid of claim 33 designated pEXJ-RGalR3T (ATCC Accession No. 97826).

37. The plasmid of claim 33 designated M54 (ATCC Accession No. 209312).

38. The plasmid of claim 33 designated M67 (ATCC Accession No. ).

39. A cell comprising the vector of claim 25.

40. A cell of claim 39, wherein the cell is a non-mammalian cell.

41. A cell of claim 40, wherein the non-mammalian cell is a Xenopus oocyte cell or a Xenopus melanophore cell.

42. A cell of claim 39, wherein the cell is a mammalian cell.

43. A mammalian cell of claim 42, wherein the cell is a COS-7 cell, a 293 human embryonic kidney cell, a NIH-3T3 cell, a mouse Y1 cell, a LM(tk-) cell or a CHO cell.

44. The 293 human embryonic kidney cell of claim 43 designated 293-rGalR3-105 (ATCC Accession No. CRL-12287).

45. The LM(tk-) cell of claim 43 designated L-hGalR3-228 (ATCC Accession No. CRL-12373).

46. An insect cell comprising the vector of claim 32.

47. An insect cell of claim 46, wherein the insect cell is an Sf9 cell.

48. An insect cell of claim 46, wherein the insect cell is an Sf21 cell.

49. A membrane preparation isolated from the cell of claim 39 or 46.

50. A nucleic acid probe comprising at least 15 nucleotides, which probe specifically hybridizes with a nucleic acid encoding a GALR3 receptor, wherein the probe has a unique sequence corresponding to a sequence present within one of the two strands of the nucleic acid encoding the GALR3 receptor contained in plasmid K1086.

51. A nucleic acid probe comprising at least 15 nucleotides, which probe specifically hybridizes with a nucleic acid encoding a GALR3 receptor, wherein the probe has a unique sequence corresponding to a sequence present within (a) the nucleic acid sequence shown in Figure 1 (Seq. ID No. 1) or (b) the reverse complement to the nucleic acid sequence shown in Figure 1 (Seq. ID No. 1).

52. A nucleic acid probe comprising at least 15 nucleotides, which probe specifically hybridizes with a nucleic acid encoding a GALR3 receptor, wherein the probe has a unique sequence corresponding to a sequence present within one of the two strands of the nucleic acid encoding the GALR3 receptor contained in plasmid pEXJ-hGalR3.

53. A nucleic acid probe comprising at least 15 nucleotides, which probe specifically hybridizes with a nucleic acid encoding a GALR3 receptor, wherein the probe has a unique sequence corresponding to a sequence present within (a) the nucleic acid sequence shown in Figure 3 (Seq. ID No. 3) or (b) the reverse complement to the nucleic acid

sequence shown in Figure 3 (Seq. ID No. 3).

54. The nucleic acid probe of claim 52 or 53, wherein the nucleic acid is DNA.

55. The nucleic acid probe of claim 52 or 53, wherein the nucleic acid is RNA.

56. A nucleic acid probe comprising a nucleic acid molecule of at least 15 nucleotides which is complementary to a unique fragment of the sequence of a nucleic acid molecule encoding a GALR3 receptor.

57. A nucleic acid probe comprising a nucleic acid molecule of at least 15 nucleotides which is complementary to the antisense sequence of a unique fragment of the sequence of a nucleic acid molecule encoding a GALR3 receptor.

58. An antisense oligonucleotide having a sequence capable of specifically hybridizing to the RNA of claim 5, so as to prevent translation of the RNA.

59. An antisense oligonucleotide having a sequence capable of specifically hybridizing to the genomic DNA of claim 4.

60. An antisense oligonucleotide of either of claims 58 or 59, wherein the oligonucleotide comprises chemically modified nucleotides or nucleotide analogues.

61. An antibody capable of binding to a GALR3 receptor encoded by the nucleic acid of claim 1.

62. The antibody of claim 61, wherein the GALR3 receptor is a human GALR3 receptor.

63. An antibody capable of competitively inhibiting the binding of the antibody of claim 61 to a GALR3 receptor.

64. An antibody of claim 61, wherein the antibody is a monoclonal antibody.

65. A monoclonal antibody of claim 64 directed to an epitope of a GALR3 receptor present on the surface of a GALR3 receptor expressing cell.

66. A pharmaceutical composition comprising an amount of the oligonucleotide of claim 58 capable of passing through a cell membrane effective to reduce expression of a GALR3 receptor and a pharmaceutically acceptable carrier capable of passing through a cell membrane.

67. A pharmaceutical composition of claim 66, wherein the oligonucleotide is coupled to a substance which inactivates mRNA.

68. A pharmaceutical composition of claim 67, wherein the substance which inactivates mRNA is a ribozyme.

69. A pharmaceutical composition of claim 66, wherein

the pharmaceutically acceptable carrier comprises a structure which binds to a receptor on a cell capable of being taken up by the cells after binding to the structure.

70. A pharmaceutical composition of claim 69 wherein the pharmaceutically acceptable carrier is capable of binding to a receptor which is specific for a selected cell type.

71. A pharmaceutical composition which comprises an amount of the antibody of claim 61 effective to block binding of a ligand to the GALR3 receptor and a pharmaceutically acceptable carrier.

72. A transgenic nonhuman mammal expressing DNA encoding a GALR3 receptor of claim 1.

73. A transgenic nonhuman mammal comprising a homologous recombination knockout of the native GALR3 receptor.

74. A transgenic nonhuman mammal whose genome comprises antisense DNA complementary to DNA encoding a GALR3 receptor of claim 1 so placed as to be transcribed into antisense mRNA which is complementary to mRNA encoding a GALR3 receptor and which hybridizes to mRNA encoding a GALR3 receptor, thereby reducing its translation.

75. The transgenic nonhuman mammal of either of claims 72 or 73, wherein the DNA encoding a GALR3 receptor additionally comprises an inducible promoter.

76. The transgenic nonhuman mammal of either of claims 72 or 73, wherein the DNA encoding a GALR3 receptor additionally comprises tissue specific regulatory elements.

77. A transgenic nonhuman mammal of any one of claims 72, 73 or 74, wherein the transgenic nonhuman mammal is a mouse.

78. A process for identifying a chemical compound which specifically binds to a GALR3 receptor which comprises contacting cells containing DNA encoding and expressing on their cell surface the GALR3 receptor, wherein such cells do not normally express the GALR3 receptor, with the compound under conditions suitable for binding, and detecting specific binding of the chemical compound to the GALR3 receptor.

79. A process for identifying a chemical compound which specifically binds to a GALR3 receptor which comprises contacting a membrane fraction from a cell extract of cells containing DNA encoding and expressing on their cell surface the GALR3 receptor, wherein such cells do not normally express the GALR3 receptor, with the compound under conditions suitable for binding, and detecting specific binding of the chemical compound to the GALR3 receptor.

80. The process of claim 78 or 79, wherein the GALR3 receptor is a mammalian GALR3 receptor.

81. The process of claim 78 or 79, wherein the GALR3 receptor has substantially the same amino acid

sequence as encoded by the plasmid K1086 (ATCC Accession No. 97747).

82. The process of claim 78 or 79, wherein the GALR3 receptor has substantially the same sequence as the amino acid sequence shown in Figure 2 (Seq. ID No. 2).

83. The process of claim 78 or 79, wherein the GALR3 receptor has the amino acid sequence shown in Figure 2 (Seq. ID No. 2).

84. The process of claims 78 or 79, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by the plasmid pEXJ-hGalR3 (ATTC Accession No. 97827).

85. The process of claim 78 or 79, wherein the GALR3 receptor has a sequence, which sequence comprises substantially the same amino acid sequence as a sequence shown in Figure 4 (Seq. ID No. 4) from amino acid 60 through amino acid 427.

86. The process of claim 78 or 79, wherein the GALR3 receptor has a sequence, which sequence comprises a sequence shown in Figure 4 (Seq. ID No. 4) from amino acid 60 through amino acid 427.

87. The process of claim 78 or 79, wherein the cells are transfected with plasmid pEXJ-RGalR3T (ATCC Accession No. 97826).

88. The process of claim 85, wherein the compound is not

previously known to bind to a GALR3 receptor.

89. A compound determined by the process of claim 88.

90. A process of claim 85, wherein the cell is an insect cell.

91. A process of claim 85, wherein the cell is a mammalian cell.

92. A process of claim 91, wherein the cell is nonneuronal in origin.

93. A process of claim 92, wherein the nonneuronal cell is a COS-7 cell, 293 human embryonic kidney cell, a CHO cell, a NIH-3T3 cell a mouse Y1 cell or LM(tk-) cell.

94. A process of claim 91, wherein the compound is not previously known to bind to a GALR3 receptor.

95. A compound determined by the process of claim 94.

96. A process involving competitive binding for identifying a chemical compound which specifically binds to a GALR3 receptor which comprises separately contacting cells expressing on their cell surface the GALR3 receptor, wherein such cells do not normally express the GALR3 receptor, with both the chemical compound and a second chemical compound known to bind to the receptor, and with only the second chemical compound, under conditions suitable

for binding of both compounds, and detecting specific binding of the chemical compound to the GALR3 receptor, a decrease in the binding of the second chemical compound to the GALR3 receptor in the presence of the chemical compound indicating that the chemical compound binds to the GALR3 receptor.

97. A process involving competitive binding for identifying a chemical compound which specifically binds to a human GALR3 receptor which comprises separately contacting a membrane fraction from a cell extract of cells expressing on their cell surface the GALR3 receptor, wherein such cells do not normally express the GALR3 receptor, with both the chemical compound and a second chemical compound known to bind to the receptor, and with only the second chemical compound, under conditions suitable for binding of both compounds, and detecting specific binding of the chemical compound to the GALR3 receptor, a decrease in the binding of the second chemical compound to the GALR3 receptor in the presence of the chemical compound indicating that the chemical compound binds to the GALR3 receptor.

98. A process of claim 96 or 97, wherein the GALR3 receptor is a mammalian GALR3 receptor.

99. The process of claim 98, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by plasmid K1086 (ATCC Accession No. 97747).

100. The process of claim 96 or 97, wherein the GALR3 receptor has substantially the same amino acid

sequence as shown in Figure 2 (Seq. ID No. 2).

101. The process of either of claims 96 or 97, wherein the GALR3 receptor has the amino acid sequence shown in Figure 2 (Seq. ID No. 2).

102. The process of claim 96 or 97, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by plasmid pEXJ-hGalR3 (ATCC Accession No. 97827).

103. The process of claim 96 or 97, wherein the GALR3 receptor has a sequence, which sequence comprises substantially the same amino acid sequence as the sequence shown in Figure 4 (Seq. ID No. 4) from amino acid 60 through amino acid 427.

104. The process of claim 96 or 97, wherein the GALR3 receptor has a sequence, which sequence comprises a sequence shown in Figure 4 (Seq. ID No. 4) from amino acid 60 through amino acid 427.

105. The process of claim 96 or 97, wherein the cells are transfected with plasmid pEXJ-RGalR3T (ATCC Accession No. 97826).

106. The process of claim 104, wherein the cell is an insect cell.

107. The process of claim 104, wherein the cell is a mammalian cell.

108. The process of claim 107, wherein the cell is nonneuronal in origin.

109. The process of claim 107, wherein the nonneuronal cell is a COS-7 cell, 293 human embryonic kidney cell, a CHO cell, a NIH-3T3 cell a mouse Y1 cell or LM(tk-) cell.

110. The process of claim 106, wherein the compound is not previously known to bind to a GALR3 receptor.

111. A compound determined by the process of claim 110.

112. A method of screening a plurality of chemical compounds not known to bind to a GALR3 receptor to identify a compound which specifically binds to the GALR3 receptor, which comprises

(a) contacting cells transfected with and expressing DNA encoding the GALR3 receptor with a compound known to bind specifically to the GALR3 receptor;

(b) contacting the preparation of step (a) with the plurality of compounds not known to bind specifically to the GALR3 receptor, under conditions permitting binding of compounds known to bind the GALR3 receptor;

(c) determining whether the binding of the compound known to bind to the GALR3 receptor is reduced in the presence of the compounds, relative to the binding of the compound in the absence of

the plurality of compounds; and if so

(d) separately determining the binding to the GALR3 receptor of each compound included in the plurality of compounds, so as to thereby identify the compound which specifically binds to the GALR3 receptor.

113. A method of screening a plurality of chemical compounds not known to bind to a GALR3 receptor to identify a compound which specifically binds to the GALR3 receptor, which comprises

(a) preparing a cell extract from cells transfected with and expressing DNA encoding the GALR3 receptor, isolating a membrane fraction from the cell extract, contacting the membrane fraction with a compound known to bind specifically to the GALR3 receptor;

(b) contacting the preparation of step (a) with the plurality of compounds not known to bind specifically to the GALR3 receptor, under conditions permitting binding of compounds known to bind the GALR3 receptor;

(c) determining whether the binding of the compound known to bind to the GALR3 receptor is reduced in the presence of the compounds, relative to the binding of the compound in the absence of the plurality of compounds; and if so

(d) separately determining the binding to the GALR3 receptor of each compound included in the

plurality of compounds, so as to thereby identify the compound which specifically binds to the GALR3 receptor.

114. A method of either of claims 112 or 113, wherein the GALR3 receptor is a mammalian GALR3 receptor.

115. A method of either of claims 112 or 113, wherein the cell is a mammalian cell.

116. A method of claim 115, wherein the mammalian cell is non-neuronal in origin.

117. The method of claim 116, wherein the non-neuronal cell is a COS-7 cell, a 293 human embryonic kidney cell, a LM(tk-) cell, a CHO cell, a mouse Y1 cell or an NIH-3T3 cell.

118. A method of detecting expression of a GALR3 receptor by detecting the presence of mRNA coding for the GALR3 receptor which comprises obtaining total mRNA from the cell and contacting the mRNA so obtained with the nucleic acid probe of claim 52 under hybridizing conditions, detecting the presence of mRNA hybridized to the probe, and thereby detecting the expression of the GALR3 receptor by the cell.

119. A method of detecting the presence of a GALR3 receptor on the surface of a cell which comprises contacting the cell with the antibody of claim 61 under conditions permitting binding of the antibody to the receptor, detecting the presence of the antibody bound to the cell, and thereby detecting the presence of a GALR3 receptor on the surface of

the cell.

120. A method of determining the physiological effects of varying levels of activity of GALR3 receptors which comprises producing a transgenic nonhuman mammal of claim 75 whose levels of GALR3 receptor activity are varied by use of an inducible promoter which regulates GALR3 receptor expression.

121. A method of determining the physiological effects of varying levels of activity of GALR3 receptors which comprises producing a panel of transgenic nonhuman mammals of claim 75 each expressing a different amount of GALR3 receptor.

122. A method for identifying an antagonist capable of alleviating an abnormality wherein the abnormality is alleviated by decreasing the activity of a GALR3 receptor comprising administering a compound to the transgenic nonhuman mammal of any one of claims 72, 75, 76, or 77, and determining whether the compound alleviates the physical and behavioral abnormalities displayed by the transgenic nonhuman mammal as a result of overactivity of a GALR3 receptor, the alleviation of the abnormality identifying the compound as an antagonist.

123. An antagonist identified by the method of claim 122.

124. A pharmaceutical composition comprising an antagonist identified by the method of claim 123 and a pharmaceutically acceptable carrier.

125. A method of treating an abnormality in a subject

wherein the abnormality is alleviated by decreasing the activity of a GALR3 receptor which comprises administering to a subject an effective amount of the pharmaceutical composition of claim 124, thereby treating the abnormality.

126. A method for identifying an agonist capable of alleviating an abnormality in a subject wherein the abnormality is alleviated by increasing the activity of a GALR3 receptor comprising administering a compound to the transgenic nonhuman mammal of any one of claims 72, 75, 76, or 77, and determining whether the compound alleviates the physical and behavioral abnormalities displayed by the transgenic nonhuman mammal, the alleviation of the abnormality identifying the compound as an agonist.

127. An agonist identified by the method of claim 126.

128. A pharmaceutical composition comprising an agonist identified by the method of claim 126 and a pharmaceutically acceptable carrier.

129. A method for treating an abnormality in a subject wherein the abnormality is alleviated by increasing the activity of a GALR3 receptor which comprises administering to a subject an effective amount of the pharmaceutical composition of claim 128, thereby treating the abnormality.

130. A method for diagnosing a predisposition to a disorder associated with the activity of a specific human GALR3 receptor allele which comprises:

a. obtaining DNA of subjects suffering from the disorder;

b. performing a restriction digest of the DNA with a panel of restriction enzymes;

c. electrophoretically separating the resulting DNA fragments on a sizing gel;

d. contacting the resulting gel with a nucleic acid probe capable of specifically hybridizing with a unique sequence included within the sequence of a nucleic acid molecule encoding a human GALR3 receptor and labelled with a detectable marker;

e. detecting labelled bands which have hybridized to the DNA encoding a human GALR3 receptor of claim 9 labelled with a detectable marker to create a unique band pattern specific to the DNA of subjects suffering from the disorder;

f. preparing DNA obtained for diagnosis by steps a-e; and

g. comparing the unique band pattern specific to the DNA of subjects suffering from the disorder from step e and the DNA obtained for diagnosis from step f to determine whether the patterns are the same or different and to diagnose thereby predisposition to the disorder if the patterns are the same.

131. The method of claim 130, wherein a disorder associated with the activity of a specific human GALR3 receptor allele is diagnosed.

132. A method of preparing the purified GALR3 receptor of claim 24 which comprises:

a. inducing cells to express GALR3 receptor;

b. recovering the receptor from the induced cells; and

c. purifying the receptor so recovered.

133. A method of preparing the purified GALR3 receptor of claim 24 which comprises:

a. inserting nucleic acid encoding the GALR3 receptor in a suitable vector;

b. introducing the resulting vector in a suitable host cell;

c. placing the resulting cell in suitable condition permitting the production of the isolated GALR3 receptor;

d. recovering the receptor produced by the resulting cell; and

e. purifying the receptor so recovered.

134. A method of modifying feeding behavior of a subject which comprises administering to the subject an amount of a compound which is a GALR3 receptor agonist or antagonist effective to increase or decrease the consumption of food by the subject so as to thereby modify feeding behavior of the subject.

135. The method of claim 134, wherein the compound is a GALR3 receptor antagonist and the amount is effective to decrease the consumption of food by the subject.

136. The method of either of claims 134 or 135, wherein the compound is administered in combination with food.

137. The method of claim 134, wherein the compound is a GALR3 receptor agonist and the amount is effective to increase the consumption of food by the subject.

138. The method of either of claims 134 or 135, wherein the compound is administered in combination with food.

139. The method of claim 134, wherein the subject is a vertebrate, a mammal, a human or a canine.

140. The method of claim 135 or 137, wherein the compound binds selectively to a GALR3 receptor.

141. The method of claim 140, wherein the compound binds to the GALR3 receptor with an affinity greater than

ten-fold higher than the affinity with which the compound binds to a GALR1 receptor.

142. The method of claim 140, wherein the compound binds to the GALR3 receptor with an affinity greater than ten-fold higher than the affinity with which the compound binds to a GALR2 receptor.

143. A method for determining whether a compound is a GALR3 antagonist which comprises:

(a) administering to an animal a GALR3 agonist and measuring the amount of food intake in the animal;

(b) administering to a second animal both the GALR3 agonist and the compound, and measuring the amount of food intake in the second animal; and

(c) determining whether the amount of food intake is reduced in the presence of the compound relative to the amount of food intake in the absence of the compound, so as to thereby determine whether the compound is a GALR3 antagonist.

144. A method of screening a plurality of compounds to identify a compound which is a GALR3 antagonist which comprises:

(a) administering to an animal a GALR3 agonist and measuring the amount of food intake in the animal;

(b) administering to a second animal the GALR3 agonist and at least one compound of the plurality of compounds and measuring the amount of food intake in the animal;

(c) determining whether the amount of food intake is reduced in the presence of at least one compound of the plurality relative to the amount of food intake in the absence of at least one compound of the plurality, and if so;

(d) separately determining whether each compound is a GALR3 antagonist according to the method of claim 122, so as to thereby identify a compound which is a GALR3 antagonist.

145. The method of either of claims 143 or 144, wherein the GALR3 agonist is galanin.

146. The method of either of claims 143 or 144, wherein the animal is a non-human mammal.

147. The method of claim 146, wherein the mammal is a rodent.

148. A process of claim 78 or 79, which further comprises determining whether the compound selectively binds to the GALR3 receptor relative to another galanin receptor.

149. The process of claim 148, wherein the determination whether the compound selectively binds to the GALR3 receptor comprises:

(a) determining the binding affinity of the compound for the GALR3 receptor and for such other galanin receptor; and

(b) comparing the binding affinities so determined, the presence of a higher binding affinity for the GALR3 receptor than for such other galanin receptor indicating that the compound selectively binds to the GALR3 receptor.

150. A process of claim 148, wherein the other galanin receptor is a GALR1 receptor.

151. A process of claim 148, wherein the other galanin receptor is a GALR2 receptor.

152. A method of decreasing feeding behavior of a subject which comprises administering a compound which is a GALR3 receptor antagonist and a compound which is a Y5 receptor antagonist, the amount of such antagonists being effective to decrease the feeding behavior of the subject.

153. The method of claim 152, wherein the GALR3 antagonist and the Y5 antagonist are administered in combination.

154. The method of claim 152, wherein the GALR3 antagonist and the Y5 antagonist are administered once.

155. The method of claim 152, wherein the GALR3 antagonist and the Y5 antagonist are administered

separately.

156. The method of claim 155, wherein the GALR3 antagonist and the Y5 antagonist are administered once.

157. The method of claim 155, wherein the galanin receptor antagonist is administered for about 1 week to 2 weeks.

158. The method of claim 155, wherein the Y5 receptor antagonist is administered for about 1 week to 2 weeks.

159. The method of claim 155, wherein the GALR3 antagonist and the Y5 antagonist are administered alternately.

160. The method of claim 159, wherein the GALR3 antagonist and the Y5 antagonist are administered repeatedly.

161. A method of claim 159 or claim 160, wherein the galanin receptor antagonist is administered for about 1 week to 2 weeks.

162. A method of claim 159 or claim 160, wherein the Y5 receptor antagonist is administered for about 1 week to 2 weeks.

163. A method of any one of claims 152, 153, 154, or 155, wherein the compound is administered in a

pharmaceutical composition comprising a sustained release formulation.

164. A method of decreasing nociception in a subject which comprises administering to the subject an amount of a compound which is a GALR3 receptor agonist effective to decrease nociception in the subject.

165. A method of treating pain in a subject which comprises administering to the subject an amount of a compound which is a GALR3 receptor agonist effective to treat pain in the subject.

166. A method of treating diabetes in a subject which comprises administering to the subject an amount of a compound which is a GALR3 receptor antagonist effective to treat diabetes in the subject.

167. A method of enhancing cognition in a subject which comprises administering to the subject an amount of a compound which is a GALR3 receptor antagonist effective to enhance cognition in the subject.

168. A process for determining whether a chemical compound is a GALR3 receptor agonist which comprises contacting cells which express the GALR3 receptor with the compound under conditions permitting the activation of the GALR3 receptor, and detecting an increase in GALR3 receptor activity, so as to thereby determine whether the compound is a GALR3 receptor agonist, wherein the cells do not normally express the GALR3 receptor.

169. A process for determining whether a chemical compound is a GALR3 receptor antagonist which comprises contacting cells which express the GALR3 receptor with the compound in the presence of a known GALR3 receptor agonist, under conditions permitting the activation of the GALR3 receptor, and detecting a decrease in GALR3 receptor activity, so as to thereby determine whether the compound is a GALR3 receptor antagonist, wherein the cells do not normally express the GALR3 receptor.

170. A process of claim 168 or 169, wherein the cells are transfected with and express DNA encoding the GALR3 receptor.

171. A process of claim 168 or 169, wherein RNA encoding and expressing the GALR3 receptor has been injected into the cells.

172. A process of any one of claims 168, 169, 170, or 171, wherein the cells also express GIRK1 and GIRK4.

173. A process of any one of claims 168, 169, 170, or 172, wherein the GALR3 receptor is a mammalian GALR3 receptor.

174. A process of claim 171, wherein the cells are injected with RNA synthesized in vitro from the plasmid of claim 37 designated M54 (ATCC Accession No. 209312).

175. A process of claim 171, wherein the cells are injected with RNA synthesized in vitro from the plasmid of claim 37 designated M67 (ATCC Accession

No. ).

176. A pharmaceutical composition which comprises an amount of a GALR3 receptor agonist determined by the process of claim 168 effective to increase activity of a GALR3 receptor and a pharmaceutically acceptable carrier.

177. A pharmaceutical composition of claim 176, wherein the GALR3 receptor agonist is not previously known.

178. A pharmaceutical composition which comprises an amount of a GALR3 receptor antagonist determined by the process of claim 169 effective to reduce activity of a GALR3 receptor and a pharmaceutically acceptable carrier.

179. A pharmaceutical composition of claim 178, wherein the GALR3 receptor antagonist is not previously known.

180. A process for determining whether a chemical compound specifically binds to and activates a GALR3 receptor, which comprises contacting cells producing a second messenger response and expressing on their cell surface the GALR3 receptor, wherein such cells do not normally express the GALR3 receptor, with the chemical compound under conditions suitable for activation of the GALR3 receptor, and measuring the second messenger response in the presence and in the absence of the chemical compound, a change in the second messenger response in the presence of the chemical compound indicating that the compound activates the GALR3 receptor.

181. The process of claim 180, wherein the second messenger response comprises potassium channel activation and the change in second messenger is an increase in the level of potassium current.

182. A process for determining whether a chemical compound specifically binds to and inhibits activation of a GALR3 receptor, which comprises separately contacting cells producing a second messenger response and expressing on their cell surface the GALR3 receptor, wherein such cells do not normally express the GALR3 receptor, with both the chemical compound and a second chemical compound known to activate the GALR3 receptor, and with only the second chemical compound, under conditions suitable for activation of the GALR3 receptor, and measuring the second messenger response in the presence of only the second chemical compound and in the presence of both the second chemical compound and the chemical compound, a smaller change in the second messenger response in the presence of both the chemical compound and the second chemical compound than in the presence of only the second chemical compound indicating that the chemical compound inhibits activation of the GALR3 receptor.

183. The process of claim 182, wherein the second messenger response comprises potassium channel activation and the change in second messenger response is a smaller increase in the level of potassium current in the presence of both the chemical compound and the second chemical compound than in the presence of only the second chemical compound.

184. A process of any one of claims 180, 181, 182 or 183, wherein the GALR3 receptor is a mammalian GALR3 receptor.

185. The process of claim 184, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by the plasmid K1086 (ATCC Accession No. 97747).

186. The process of claim 184, wherein the GALR3 receptor has substantially the same amino acid sequence as that shown in Figure 2 (Seq. ID No. 2).

187. The process of claim 184, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by the plasmid pEXJ-hGalR3 (ATCC Accession No. 97827).

188. The process of claim 184, wherein the GALR3 receptor has a sequence, which sequence comprises substantially the same amino acid sequence as that shown in Figure 4 (Seq. ID No. 4) from amino acid 60 through amino acid 427.

189. The process of claim 184, wherein the GALR3 receptor has a sequence, which sequence comprises a sequence shown in Figure 4 (Seq. ID No. 4) from amino acid 60 through amino acid 427.

190. The process of claim 184, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by the plasmid pEXJ-RGalR3T (ATCC Accession No. 97826).

191. The process of claim 184, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by the plasmid M54 (ATCC Accession No. 209312).

192. The process of claim 184, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by the plasmid M67 (ATCC Accession No. ).

193. The process of any one of claims 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, or 192, wherein the cell is an insect cell.

194. The process of any one of claims 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, or 192, wherein the cell is a mammalian cell.

195. The process of claim 194, wherein the mammalian cell is nonneuronal in origin.

196. The process of claim 195, wherein the nonneuronal cell is a COS-7 cell, CHO cell, 293 human embryonic kidney cell, NIH-3T3 cell or LM(tk-) cell.

197. The process of claim 196, wherein the nonneuronal cell is the 293 human embryonic kidney cell designated 293-rGALR3-105 (ATCC Accession No. CRL-12287).

198. The process of claim 196, wherein the nonneuronal cell is the LM(tk-) cell designated L-hGALR3-228 (ATCC Accession No. CRL-12373).

199. The process of claim 194, wherein the compound is not previously known to bind to a GALR3 receptor.

200. A compound determined by the process of claim 199.

201. A pharmaceutical composition which comprises an amount of a GALR3 receptor agonist determined by the process of claim 180 or 181 effective to increase activity of a GALR3 receptor and a pharmaceutically acceptable carrier.

202. A pharmaceutical composition of claim 201, wherein the GALR3 receptor agonist is not previously known.

203. A pharmaceutical composition which comprises an amount of a GALR3 receptor antagonist determined by the process of any one of claims 182 or 183 effective to reduce activity of a GALR3 receptor and a pharmaceutically acceptable carrier.

204. A pharmaceutical composition of claim 203, wherein the GALR3 receptor antagonist is not previously known.

205. A method of screening a plurality of chemical compounds not known to activate a GALR3 receptor to identify a compound which activates the GALR3 receptor which comprises:

(a) contacting cells which express the GALR3 receptor with the plurality of compounds not known to activate the GALR3 receptor, under conditions permitting activation of the GALR3

receptor, wherein the cells do not normally express the GALR3 receptor;

(b) determining whether the activity of the GALR3 receptor is increased in the presence of the compounds; and if so

(c) separately determining whether the activation of the GALR3 receptor is increased by each compound included in the plurality of compounds, so as to thereby identify the compound which activates the GALR3 receptor.

206. The process of claim 205, wherein the cells also express GIRK1 and GIRK4.

207. A method of claim 205, wherein the GALR3 receptor is a mammalian GALR3 receptor.

208. A method of screening a plurality of chemical compounds not known to inhibit the activation of a GALR3 receptor to identify a compound which inhibits the activation of the GALR3 receptor, which comprises:

(a) contacting cells which express the GALR3 receptor with the plurality of compounds in the presence of a known GALR3 receptor agonist, under conditions permitting activation of the GALR3 receptor, wherein the cells do not normally express the GALR3 receptor;

(b) determining whether the activation of the GALR3

receptor is reduced in the presence of the plurality of compounds, relative to the activation of the GALR3 receptor in the absence of the plurality of compounds; and if so

(c) separately determining the inhibition of activation of the GALR3 receptor for each compound included in the plurality of compounds, so as to thereby identify the compound which inhibits the activation of the GALR3 receptor.

209. The process of claim 208, wherein the cells also express GIRK1 and GIRK4.

210. A method of claim 208 or 209, wherein the GALR3 receptor is a mammalian GALR3 receptor.

211. A method of any one of claims 205, 206, 207, 208, 209, or 210 wherein the cell is a mammalian cell.

212. A method of claim 211, wherein the mammalian cell is non-neuronal in origin.

213. The method of claim 212, wherein the non-neuronal cell is a COS-7 cell, a 293 human embryonic kidney cell, a LM(tk-) cell or an NIH-3T3 cell.

214. A pharmaceutical composition comprising a compound identified by the method of any one of claims 205, 206, or 207 effective to increase GALR3 receptor activity and a pharmaceutically acceptable carrier.

215. A pharmaceutical composition comprising a compound identified by the method of any one of claims 208, 209 or 210 effective to decrease GALR3 receptor activity and a pharmaceutically acceptable carrier.

216. A process of any one of claims 168, 180 or 181, which further comprises determining whether the compound selectively activates the GALR3 receptor relative to another galanin receptor.

217. The process of claim 216, wherein the determination whether the compound selectively activates the GALR3 receptor comprises:

(a) determining the potency of the compound for the GALR3 receptor and for such other galanin receptor; and

(b) comparing the potencies so determined, the presence of a higher potency for the GALR3 receptor than for such other galanin receptor indicating that the compound selectively activates the GALR3 receptor.

218. A process of claim 217, wherein such other galanin receptor is a GALR1 receptor.

219. A process of claim 217, wherein such other galanin receptor is a GALR2 receptor.

220. A process of any one of claims 169, 182 or 183, which further comprises determining whether the compound selectively inhibits the activation of the

GALR3 receptor relative to another galanin receptor.

221. The process of claim 210, wherein the determination whether the compound selectively inhibits the activation of the GALR3 receptor comprises:

(a) determining the decrease in the potency of a known galanin receptor agonist for the GALR3 receptor in the presence of the compound, relative to the potency of the agonist in the absence of the compound;

(b) determining the decrease in the potency of the agonist for such other galanin receptor in the presence of the compound, relative to the potency of the agonist in the absence of the compound; and

(c) comparing the decrease in potencies so determined, the presence of a greater decrease in potency for the GALR3 receptor than for such other galanin receptor indicating that the compound selectively inhibits the activation of the GALR3 receptor.

222. A process of claim 221, wherein such other galanin receptor is a GALR1 receptor.

223. A process of claim 221, wherein such other galanin receptor is a GALR2 receptor.

224. A process for determining whether a chemical compound is a GALR3 receptor agonist, which

comprises preparing a cell extract from cells transfected with and expressing DNA encoding the GALR3 receptor, isolating a membrane fraction from the cell extract, separately contacting the membrane fraction with both the chemical compound and GTPγS, and with only GTPγS, under conditions permitting the activation of the GALR3 receptor, and detecting GTPγS binding to the membrane fraction, an increase in GTPγS binding in the presence of the compound indicating that the chemical compound activates the GALR3 receptor.

225. A process for determining whether a chemical compound is a GALR3 receptor antagonist, which comprises preparing a cell extract from cells transfected with and expressing DNA encoding the GALR3 receptor, isolating a membrane fraction from the cell extract, separately contacting the membrane fraction with the chemical compound, GTPγS and a second chemical compound known to activate the GALR3 receptor, with GTPγS and only the second compound, and with GTPγS alone, under conditions permitting the activation of the GALR3 receptor, detecting GTPγS binding to each membrane fraction, and comparing the increase in GTPγS binding in the presence of the compound and the second compound relative to the binding of GTPγS alone, to the increase in GTPγS binding in the presence of the second chemical compound relative to the binding of GTPγS alone, a smaller increase in GTPγS binding in the presence of the compound and the second compound indicating that the compound is a GALR3 receptor antagonist.

226. A process of claim 224 or 225, wherein the GALR3 receptor is a mammalian GALR3 receptor.

227. The process of claim 226, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by the plasmid K1086 (ATCC Accession No. 97747).

228. The process of claim 226, wherein the GALR3 receptor has substantially the same amino acid sequence as that shown in Figure 2 (Seq. ID No. 2).

229. The process of claim 226, wherein the GALR3 receptor has substantially the same amino acid sequence as encoded by the plasmid pEXJ-hGalR3 (ATCC Accession No. 97827).

230. The process of claim 226, wherein the GALR3 receptor has a sequence, which sequence comprises substantially the same amino acid sequence as that shown in Figure 4 (Seq. ID No. 4) from amino acid 60 through amino acid 427.

231. The process of claim 226, wherein the GALR3 receptor has a sequence, which sequence comprises a sequence shown in Figure 4 (Seq. ID No. 4) from amino acid 60 through amino acid 427.

232. The process of any one of claims 224, 225, 226, 227, 228, 229, 230, or 231 wherein the cell is an insect cell.

233. The process of any one of claims 224, 225, 226, 227, 228, 229, 230, or 231, wherein the cell is a mammalian cell.

234. The process of claim 233, wherein the mammalian cell is nonneuronal in origin.

235. The process of claim 234, wherein the nonneuronal cell is a COS-7 cell, CHO cell, 293 human embryonic kidney cell, NIH-3T3 cell or LM(tk-) cell.

236. The process of claim 235, wherein the nonneuronal cell is the 293 human embryonic kidney cell designated 293-rGALR3-105 (ATCC Accession No. CRL-12287).

237. The process of claim 235, wherein the nonneuronal cell is the LM(tk-) cell designated L-hGALR3-228 (ATCC Accession No. CRL-12373).

238. The process of claim 233, wherein the compound is not previously known to bind to a GALR3 receptor.

239. A compound determined by the process of claim 238.